NOAA Northeast Drought and Climate Forum

October 11, 2016
UMass Boston, McCormack Hall, 3rd Floor, Boston, MA
Summary for USDA Northeast Climate Hub, Prepared by Mary Carey

Contents

General Information/Background:

This all-day Drought and Climate Forum convened stakeholders throughout the Northeast to provide information on current drought conditions across the Northeast region; drought outlooks; and response, planning, and preparedness resources at the federal, state, and local level. Agenda topics included:

- Detailed drought outlook for the rest of 2016
- Drought impacts to date

- Response and preparedness strategies
- Resources for early warning of drought
- Drought programs and assistance
- Open discussion on drought-related information needs for critically affected sectors and communities

Speakers included experts from NOAA's Northeast Regional Climate Center, USDA, the U.S. Geological Survey, the National Weather Service, and FEMA. Also invited were state leaders from state climatologists' offices, fisheries agencies, industry associations, and others.

Full video recording of the meeting:
https://www.youtube.com/watch?v=LJ0WPz1PsTA&feature=youtu.be

Note: This summary only includes speakers and discussions specifically of interest to the agricultural community.

Current Drought Conditions and 2016 Outlook

Samantha Borisoff (Northeast Regional Climate Center, Cornell University)

- Multiple past timeframes (3 months, 6 months, 12 months, 24 months, and beyond) have shown below normal precipitation in the Boston area/Eastern Massachusetts.
- We have also seen a longer-term pattern of dryness, including last winter (2015-2016) due to lack of snowfall and snowmelt. Even two winters ago (2014-2015), when New England received a large amount of snow at above average levels, the snow was abnormally dry and therefore less than expected moisture resulted from that snowmelt.
- We have seen significantly increased evapotranspiration levels as a result of this drought, which has direct implications for crop survival rates.
- Palmer Drought Severity Index is an index of dryness based on water supply and demand, and is a good tool for measuring dryness. According to this index, this is the worst drought since 2000, but the dryness index is not as significant as it was in the droughts which occurred in the 1960s or the 1930s. The latest Z-index map of the nation as of September 2016 (issued October 12, 2016) shows all of New England in extreme or severe drought, but also New York and parts of Pennsylvania in moderate or severe drought.

Ed Capone (NOAA/Northeast River Forecast Center)

- When reviewing the entire state of MA via the Palmer Drought Severity Index, drought has occurred with less frequency, but is more intense and sudden than in the past. This can also be referred to as "flash droughts," which is a relatively new term and phenomenon.
- The issue previously mentioned by Samantha about the large snowfall being dry is measured by the following statistics: normal snowfall level to precipitation levels in New England are 10 inches of snowfall to 1 inch of moisture; however,

the snowfall from two winters ago (2014-2015) had a snowfall to precipitation level ratio of 20-30 inches: 1 inch.

- While this drought is not as severe when comparing against the 1960's drought, the river and groundwater levels are reaching record lows, primarily due to increased urbanization, and therefore a lack of water recharge. This makes water less available to agricultural uses.
- More frequently, big droughts are now ending with big floods!

Gardner Bent & Tom Mack (USGS/New England Water Science Center)

- USGS Water Watch tool displays the extent to which the drought is measured in low streamflow levels in the Northeast region (and nation-wide). This tool can also be used to measure flooding.
- Saco River, Ipswich River (in MA) – record 100-year lows (under 1 cubic ft per second) as of June/July 2016.
- Increase in population, change in land use has exacerbated effects of drought and explains the record lows even with non-record low precipitation levels.
- Groundwater wells (measurement wells, not actively used wells) are measuring well below normal, mostly 10-24% of normal levels, with some <10% of normal water levels.
- Drought effects on groundwater conditions can vary based on factors such as aquifer porosity and thickness.

Brad Rippey (USDA OCE, Meteorologist)

- La Nina and El Nino are strong predictors of climate.
- There is a low forecast confidence for the next year, so predictions are likely to not be highly accurate.
- NOAA provides 30-month forecasts showing easy to understand 3-category designations (below, middle, and above normal precipitation levels).
- NOAA also provides a U.S. Seasonal Drought Outlook showing a 3-month prediction of whether a drought will persist, remain but improve, likely will dissipate, or likely to develop.
- New England predicted to have above normal temperatures for the latter part of 2016, but no great certainty predicted for temperatures or precipitation.

Drought Impacts and Responses

David Hollinger (USDA Northeast Climate Hub, U.S. Forest Service)

- Climate hubs are a cross-USDA regional partnership with land grant universities.
- Goal is to help farmers and landowner adapt to climate change and extreme weather variability.
- Farmers in the NE are hurting because yields are down (or are gone), and prices are hitting multi-year lows. The NASS Crop progress report for the northeast shows 32% of topsoil as being "short" of moisture, and 18% as being "very short."

- Cornell's climate smart farming initiative provides multiple summaries and tools available to northeast producers, such as:
    - Summary of Climate Change and Agriculture: https://blogs.cornell.edu/cicca/files/2014/06/CornellClimateChange_Farming-Success-in-an-Uncertain-Climate_FINAL-2kvpu14.pdf
    - Irrigation Scheduler: https://www.nyclimatescience.org/catalog/doc?DocId=vitroIndividual:http://www.nyclimatescience.org/individual/n33229
- Two drought surveys have revealed a relatively low participation rate in crop insurance or FSA's Noninsured Crop Disaster Assistance Program (NAP) in this region:
    - U. Of Maine Drought Survey: Showing relevant information such as where farmers get their irrigation water from, whether or not they have experienced crop damage or loss, or whether they have crop insurance (89% of respondents said no). https://extension.umaine.edu/penobscot/blog/2016/10/03/maine-farmers-polled-about-crop-damage-due-to-drought/
    - U. of Mass Disaster assistance drought survey showing extensive acreages damaged across the state and across multiple crops (contact me for results, they are not available online, but I can get them from the climate hub). Hay, cranberries, potatoes, tomatoes, squash, and other vegetables have had large losses greater than 30%. Many operations do not have crop insurance or NAP coverage.

U.S. Rep Seth Moulton

MA – District 6, one of the hardest hit districts as a result of the drought.

- For farmers who have suffered losses this summer, they are expecting additional losses this fall
- Estimated $13.6 million in crop losses so far estimated across the state
- Highlighted the need for more crop insurance… *"too many farmers here have crops that are uninsured because extreme drought is not something that we are used to, and so that has made the impact more harder-felt…."*
- Highlighted the increased rate at which farms, primarily dairy farms, in this region are going out of business partly as a result of this drought even when low-interest loans are available.

Drought Task Force Panel – State Decisions across the NE

This panel focused on state-specific policy around the ongoing drought. Representatives were as follows:

- New York: Michael Holt (NY Dept. of Environmental Conservation)
- Massachusetts: Vandana Rao (MA Dept. of Energy and Environmental Affairs)

- Connecticut: David LeVasseur (CT Office of Policy and Management)
- Rhode Island: Kathleen Crawley (RI Water Resources Board)
- New Hampshire: Brandon Kernen (NH Dept. of Environmental Services)
- Maine: Thomas Redstone (Maine Emergency Management Agency)

Key Messages:

- Rural areas struggle with wells going dry, and restricting individuals from drawing common water from their own wells. New Hampshire passed a law (2007) in response to the last drought which gave towns the authority to ban individuals from drawing well water. Many towns/municipalities do not have the authority to do this in other states and therefore the common water supply is at risk.
- Some states struggle with obtaining stats/figures in order to calculate economic impacts of disasters, especially with less acute, slower disasters such as drought.
- Major concern not only with lack of water quantity, but also water quality – for example, water could also be lost to contaminants in addition to the drought itself.
- Many states struggle to communicate drought information to the public because it is such a complex issue.
- Two of these states use the U.S. Drought monitor instead of a state-specific classification to implement their drought plans. They find this reduces confusion.

Drought Early Warning Information in Northeast

Drought Assistance and Preparedness

Brad Rippey (USDA OCE, Meteorologist)

- Since 2004, the U.S. Drought Monitor has significantly improved because it has moved to being a GIS-based product. There are approximately 68 GIS layers which go into this one map, as well as feedback/contributions from reviewers at a local level.

- As of August 9, the first-ever D3 designation was given in MA since the inception of the U.S. Drought Monitor in 1999. Here is a table showing approximate percentiles of occurrence for each drought designation:

Drought Designation	**Percentiles of Occurrence**
D4, Exceptional Drought	Once per 50-100 years
D3, Extreme Drought	Once per 20-50 years
D2, Severe Drought	Once per 10-20 years
D1, Moderate Drought	Once per 5-10 years
D0, Abnormally Dry	Once per 3-5 years

- NWS unofficial topsoil and subsoil moisture maps show they have never seen it worse in NH, MA, and RI. NLDAS Total column moisture is extremely low across entire northeast.

- NWS unofficial pasture and range condition maps show historically low conditions in NH and MA.

Samantha Borisoff (NRCC)

- The NRCC has a weekly drought update, relating to the U.S. Drought Monitor and also has precipitation and temperature maps showing the rankings across the region (e.g. #1 driest measurement site in the northeast, etc.). Weekly update also summarizes state-level drought declarations, as well as short-term forecast for next 7 days.
- SC ACIS is a good map and chart-based tool. It also includes a multi-station graph which shows simple lines on a chart showing departures from normal.
- Quarterly reports showing seasonal summaries. Includes current conditions, impacts, and outlooks. Currently there are 3 products: Eastern Region, Gulf of Maine Region, and Great Lakes Region.

Nicole Belk and Alan Dunham (National Weather Service (NWS)/Boston Weather Forecast Office)

- 123 NWS forecast offices nation-wide, and each state has a NWS state liaison office.
- NWS is now using social media (e.g. Twitter) to get time-sensitive information out – could be useful to know for USDA purposes.

Keith Robinson (USGS)

- USGS Stream stats – a tool more used for flooding purposes.
- Developing a new tool in concert with Rhode Island to show the impacts of climate change on stream flow.
- There is a need for us to better capture excess water and store it for later when there is a drought. This point was later stressed by a farmer in the audience.

Drought Assistance and Preparedness

Jon Niedzielski (USDA-FSA, MA SED)

- Provided an overview of FSA disaster assistance programs and disaster declaration process
- Discussed triggers used via the U.S. Drought Monitor, STORM, and Loss Assessment Reports
- Stressed that the Loss Assessment report is very useful as a record of what happened on the ground at a specific point in time, and includes yield

information, estimated damages and losses etc., even if at this time it might only bring relief via a low-interest loan.

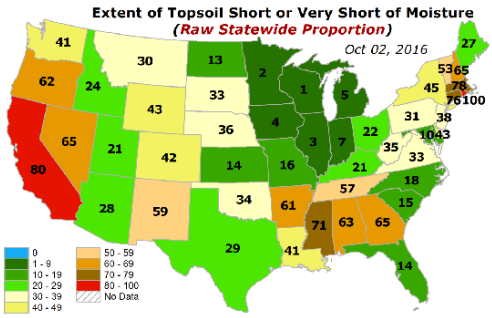
- Example: An $8 million production loss for tree fruit growers (half of which was for peaches) was estimated as a result of these reports in MA

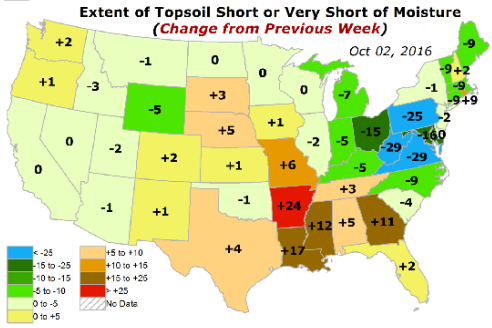
Christine Clark (USDA-NRCS, MA State Conservationist)

- NRCS works hand in hand with FSA to determine client eligibility.
- NRCS provides long-term support to make operations more resilient to adverse weather.
- Provides technical and financial assistance for many programs, such as EQIP.

Index of Tools/Websites of Interest

- Northeast Regional Climate Center (NRCC) – provides outlook reports, special reports (such as on the drought), many maps showing precipitation, temperature, etc. including monthly maps with accompanying narratives, summary charts and tables, northeast drought updates, and other publications.
- Palmer Drought Severity Index (NOAA)
- Northeast River Forecast Center (NOAA)
- USGS Water Watch tool (USGS)
- U.S. Seasonal Drought Outlook (NOAA)
- Cornell Institute for Climate Smart Solutions
    - Cornell Climate Smart Farming
        - Multiple tools, such as the Growing Degree Day Calculator
- NOAA Weather-Ready Nation
- U. Of Maine Drought Survey
- NASS Crop Progress Reports for Massachusetts; select state in dropdown for other states.
- Ag Land in Drought Report, USDA OCE
- Weekly Weather and Crop Bulletin, USDA OCE
- National Climate Assessment – Agriculture
- SC ACIS – many map-based products from this tool/database (over 20 customizable)
- NOAA topsoil and subsoil moisture levels departure from normal nation-wide maps by state. This link may be updated, so attached is the PDF





- NWS/CPC unofficial [pasture and rangeland condition](#) maps. Link may get updated, PDF of this point in time below.